EXHIBIT 3

```
 1                 UNITED STATES DISTRICT COURT

 2               NORTHERN DISTRICT OF CALIFORNIA

 3                   SAN FRANCISCO DIVISION
     _____
 4   REARDEN LLC, REARDEN MOVA      )
     LLC, California limited        )
 5   liability companies,           )
                                    )
 6             Plaintiffs,          )
                                    )
 7   v.                             )  Case No. 4:17-CV-04006-JST
                                    )            4:17-CV-04191-JST
 8   THE WALT DISNEY COMPANY,       )
     a Delaware corporation,        )
 9   WALT DISNEY MOTION             )
     PICTURES GROUP, INC., a        )
10   California corporation,        )
     BUENA VISTA HOME               )
11   ENTERTAINMENT, INC. A          )
     California corporation,        )
12   MARVEL STUDIOS, LLC, a         )
     Delaware limited               )
13   liability company,             )
     MANDEVILLE FILMS, INC., a      )
14   California corporation,        )
                                    )
15             Defendants.          )
     _____)
16

17                    CONFIDENTIAL

18               Deposition of HAO LI

19                via videoconference

20              Thursday, May 28, 2020

21

22

23

24      Michael P. Hensley, RDR, CSR No. 14114

25
```

REARDEN LLC, ET AL. vs THE WALT DISNEY COMPANY, ET AL.
Hao Li on 05/28/2020

Confidential

1   Do you see that?

2 A.   Okay.

3 Q.   Now, I thought when we were talking about

4 real-time data capture, that was a lower resolution

5 capture. Am I mistaken about that?

6 A.   Yes. So within this context, the real time does

7 not necessarily refer to as the whole pipeline being

8 real time. In this case, the real-time data capture is

9 more about capturing a recording at 30 frames per

10 second.

11   That was, back then, also sort of a novelty.

12 Q.   Okay. And so you say when the purpose is to

13 capture human faces, they need to be captured at very

14 high resolution.

15 A.   Right.

16 Q.   Is that right?

17 A.   Right.

18 Q.   Okay. And why is that so?

19 A.   Well, if it's low resolution, then you lose

20 details of how faces deform. And, hence, the result of

21 your output is no longer an accurate representation of

22 the person -- the subject's face. And you will end up

23 having the problem of the uncanny valley.

24 Q.   Okay. So subtleties and nuances in a

25 performer's facial expression would be lost unless you

REARDEN LLC, ET AL. vs THE WALT DISNEY COMPANY, ET AL.

 1   are capturing at very high resolution; is that right?

 2   A.   That's right.

 3   Q.   Then if you turn to page 18 -- and I'm now

 4   talking about the first full paragraph, the one that

 5   begins with the word "nevertheless." Do you see that?

 6   A.   Yes.

 7   Q.   And the third sentence in that paragraph is "The

 8   main advantage of using high-resolution capture data

 9   over alternative animation techniques, such as physical

10   simulation or keyframing, is that realistic and complex

11   surface dynamics come for free."

12   Do you see that language?

13   A.   I do.

14   Q.   Okay. So I guess rather than me trying to

15   paraphrase that, can you just sort of unpack that

16   sentence for me.

17   A.   Yeah. So the -- the -- so this sentence is

18   specifically trying to explain why, you know, dense

19   facial capture is important and what the motivation is

20   behind it and what its advantages or over, let's say,

21   other traditional techniques back then like traditional

22   keyframing, which is traditional animation by hand. Or

23   if things are using physical simulation, for example, if

24   you have certain activations and it would activate

25   muscles and muscles would translate into facial

1   expressions, that is very difficult to set up.

2   Yet the argument here is that if you have the

3   ability -- if you have the ability to capture, you know,

4   a 3D representation of the face, then the data is

5   there -- right? -- so you can get it.

6   But what it doesn't mean is that -- and that's

7   why there is this whole thesis -- is that you can

8   immediately use the data. But the nice thing is it

9   comes for free, because we do see that the data is

10   there. So an analogy to this is that if I have a video

11   recording of you, every information that I'm supposed to

12   see is there. But then how I can translate that

13   information from video recording of you to an actual CG

14   character, that's -- that's the other -- that's the

15   other problem.

16   Q.   And so this -- I guess --

17   What you're saying here is that, you know, if

18   you want to do realistic and complex surface dynamics,

19   you know, for -- for facial performance using physical

20   simulation or keyframing, it takes a lot of time and

21   animators to do that work, it's labor intensive, whereas

22   all of the -- you know, the -- you know, the nuances,

23   the realistic and complex nuances of a person's facial

24   expression, those -- those come along for free,

25   essentially, if you have a high-resolution capture data.

 1   MR. KLAUS: Objection. Objection.

 2   Mischaracterizes the witness's testimony. Vague and

 3   ambiguous.

 4   You may answer, Dr. Li.

 5   THE WITNESS: That's right.

 6   BY MR. CARLSON:

 7   Q.   Okay. So now I'm going to ask you to come -- to

 8   turn to page 25. And I'm interested here in Section 2.2

 9   of the chapter. It's called "Dynamic Shape Acquisition

10   Techniques."

11   A.   Okay.

12   Q.   Let me know when you have that in front of you.

13   A.   I have it.

14   Q.   Okay. In this section, you're describing

15   different methodologies for real-time 3D capture; is

16   that correct?

17   A.   Yeah.

18   Q.   And then on page -- flip you up to page 29. On

19   page 29, you discuss dense marker capture systems. Do

20   you see those? Do you see that?

21   A.   Mm-hmm.

22   Q.   Okay. And so what are dense marker capture

23   systems? What are examples of those?

24   A.   Let me have a look first.

25   Q.   Sure.

```
 1   personal, hands-on experience with commercial dense

 2   marker capture systems.

 3         I -- I have this clone cam, or whatever it's

 4   called, that you've identified as one that you had

 5   personal experience with at ILM.  And I recognize your

 6   testimony that, well, gee, there was a lot of them.  I

 7   don't know.

 8         But, you know, can -- can you tell me which ones

 9   that you do know of, commercial dense marker capture

10   systems that you have hands-on experience with.

11   A.     Well, what's important is the pipeline, the

12   internal pipelines at ILM.  There are pipelines from

13   Weta Digital.  And each of that's companies might have

14   different flavors of different pipelines.  Clone cam is

15   one part of it.  I've actually forgot the names of

16   other -- I mean, they all have code names.  And I have

17   worked with, you know, some commercial ones which are

18   from -- in the research -- like, in the -- in research

19   labs at universities.

20   Q.     Okay.  So -- but -- can you give me the names of

21   the commercial products that you have hands-on

22   experience with, at least the ones that you recall,

23   sitting here today?

24   A.     Well, I have -- well -- I mean, the -- I

25   don't -- so I don't know exactly what you're -- so with
```

1   commercial, I meant that is not in university.

2   Q.   Yes.

3   A.   And, you know, dense marker-based systems that I

4   know of were used -- well, okay. Dense -- so are you

5   saying dense with markers or dense without mark -- or,

6   you know, just dense capturing?

7   Q.   Dense -- dense capture.

8   A.   Okay. Dense capture, well, I worked on data

9   from, you know, that were used at Weta Digital that I

10   worked directly on -- on capture, on processing, and

11   everything. And I work on the ones at ILM. And at

12   ILM -- actually, speaking of which, at ILM we also used

13   MOVA data for, you know, specific tests, and I was also

14   working on those.

15   THE REPORTER: Dr. Li, this is the court

16   reporter. If you could be so kind as to slow down a bit

17   on your answers to make sure I'm capturing all of that

18   entirely, I would appreciate it.

19   THE WITNESS: Okay.

20   BY MR. CARLSON:

21   Q.   So --

22   MR. KLAUS: Mr. Court Reporter, I'm sorry. I

23   just noticed in the last answer you had written down

24   "mobile data." And I think Dr. Li said "MOVA data,"

25   M-O-V-A.

REARDEN LLC, ET AL. vs THE WALT DISNEY COMPANY, ET AL.

```
 1              THE WITNESS:  That is correct.

 2              MR. KLAUS:  Thank you.  Thank you.

 3    BY MR. CARLSON:

 4    Q.        Okay.  So maybe my question isn't -- isn't

 5    clear.  When you say you worked with MOVA data, did you

 6    personally -- were you personally present for the MOVA

 7    capture session or the using MOVA to create the tracking

 8    mesh?  Were you present for -- for either of those

 9    events?

10    A.        No.  I was present -- so let me back up.

11              But -- so the -- I wasn't present in the actual

12    capture session, if it -- if it was regarding MOVA.  I

13    wasn't present during the actual capturing session of

14    MOVA of the actors -- or, actually, as a matter of fact,

15    I've never seen the system in action, like, myself.

16              For the processing build, there have been a lot

17    interactions between -- for example, Ken Pearce and the

18    teams at ILM.  And we were involved in giving feedback,

19    getting improved results.  So there was a

20    back-and-forth.  But most of my involvement was on using

21    the data for -- you know, how ILM was using the data.

22    And it was for building facial rigs.

23    Q.        Right.  So you're -- when we're talking about

24    the -- you're using the MOVA data, you weren't involved

25    in using the MOVA Contour software --
```

REARDEN LLC, ET AL. vs THE WALT DISNEY COMPANY, ET AL.

```
 1    A.        No.

 2    Q.        -- to process that data yourself.

 3    A.        No, I wasn't.

 4    Q.        Correct?

 5    A.        Correct.

 6    Q.        And so you -- you've mentioned a couple times

 7    the Weta Digital digital proprietary systems.  Did they

 8    have a name for those?

 9    A.        No.  I mean, maybe they had.  I can't remember

10    or I don't know what the name is.  But maybe there

11    wasn't a name.  It was a -- it wasn't a -- I mean, it's

12    just -- I mean, you know, for -- it's nothing really

13    particular; right?  It's basically just multiuse stereo.

14    And you do mesh tracking; right?  And it's just -- I

15    mean, it's -- it's a very challenging process.  But it's

16    a -- it's a standard approach; right?

17              So many -- many companies who have facial

18    performance capture systems -- I mean, there's, like --

19    probably, like, DI4D.  There's a lot of venders that

20    have these kind of capabilities, and it's always more or

21    less the same.  It's capturing faces and then being able

22    to generate a tracked mesh.  And that's sort of like

23    the -- if -- a nice approach to get high fidelity, you

24    know, facial tracking for the effects companies.

25    Q.        Yes.  And I'm just trying to get arms around
```

```
 1              CERTIFICATE OF SHORTHAND REPORTER

 2

 3        I, Michael P. Hensley, Registered Diplomate

 4   Reporter for the State of California, CSR No. 14114, the

 5   officer before whom the foregoing deposition was taken,

 6   do hereby certify that the foregoing transcript is a

 7   true and correct record of the testimony given; that

 8   said testimony was taken by me stenographically and

 9   thereafter reduced to typewriting under my direction;

10   that reading and signing was requested; and that I am

11   neither counsel for, related to, nor employed by any of

12   the parties to this case and have no interest, financial

13   or otherwise, in its outcome.

14

15

16

17

18              Michael P. Hensley, CSR, RDR

19

20

21

22

23

24

25
```